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Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019
Storage Area Network

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. What is a data center? Explain the key characteristics of the data center elements. (06 Marks)
- b. Explain the key components of the disk drive system. (06 Marks)
- c. Consider a disk I/O system in which an I/O request arrives at a rate of 100 I/Os per second. The service time is 8 ms. Computing the following :
 - i) Utilization of I/O controller
 - ii) Total response time
 - iii) Average queue size
 - iv) Total time spent by a request in queue. (08 Marks)
- 2 a. Discuss in detail the role of cache in the intelligent storage system. (10 Marks)
- b. Explain the working of RAID-4 and RAID-5 with a neat diagram. (10 Marks)
- 3 a. Explain SCSI-3 architecture with a neat diagram. (06 Marks)
- b. Define the term “SAN-storage area network”. Explain the different types of FC-ports with a neat diagram. (08 Marks)
- c. Discuss the concept of zoning and its types. (06 Marks)
- 4 a. What is NAS? What are the benefits of NAS? (06 Marks)
- b. List down the factors affecting NAS performance and availability. (06 Marks)
- c. What is iSCSI? Explain iSCSI protocol stack with a neat block diagram. (08 Marks)

PART – B

- 5 a. Explain the concept of CAS with its architecture. List down any four essential features of CAS solution. (10 Marks)
- b. With a neat diagram, explain the working of In-Band and Out-of-Band methodology in storage virtualization configuration. (10 Marks)
- 6 a. What is failure analysis? How is fault tolerance implementation done to overcome single point of failures in storage network infrastructure? (10 Marks)
- b. Explain the process of Backup operation and restore operation with a neat diagram. (10 Marks)
- 7 a. Explain the concept and working of LVM-based replication with advantages and limitations. (10 Marks)
- b. What is remote replication? Explain the concept of synchronous replication and asynchronous replication. (10 Marks)
- 8 a. Explain the following SAN security mechanism :
 - i) LUN masking and zoning
 - ii) Switch-wide and fabric-wide access control. (08 Marks)
- b. List and explain four security attributes of a storage security framework. (04 Marks)
- c. What is monitoring? Explain the concept of accessibility monitoring with a neat diagram. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.